

WHAT IS CLAIMED IS:

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1. A composition for treating the inside of a porous article comprising an enzyme having a polyphenol oxidizing activity and a substrate therefor.

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2. The composition for treating the inside of a porous article as claimed in claim 1, wherein the composition contains a phenolic compound and/or an aromatic amine compound.

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3. The composition for treating the inside of a porous article as claimed in claim 2, wherein the phenolic compound and/or the aromatic compound are or is lignin or lignin derivatives.

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4. The composition for treating the inside of a porous article as claimed in claim 3, wherein the lignin derivative is lignosulfonic acid or lignosulfonate.

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20 5. The composition for treating the inside of a porous article as claimed in claim 3 or 4, wherein the substrate for the enzyme comprises lignin, lignosulfonic acid, or lignosulfonate obtainable by removing a portion of a water insoluble solid component by centrifugation or filtration.

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6. The composition for treating the inside of a porous article as claimed in claim 2, wherein the phenolic compound and/or

the aromatic amine compound are or is an aromatic compound having a substituent containing in addition to a hydroxyl group and/or an amino group, a polyoxyethylene, a polyethyleneimine, or a C1 to C22 saturated or unsaturated alkyl chain as a structural part.

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B1 > 7. The composition for treating the inside of a porous article as claimed in any one of claims 2 to 6, wherein the composition contains an unsaturated fatty acid, an unsaturated alcohol, or an unsaturated alkyl compound.

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15 8. The composition for treating the inside of a porous article as claimed in any one of claims 1 to 7, wherein the composition contains at least one chemical agent selected from a fragrant, a deodorant, a rust preventive, a flame retardant, an antibacterial agent, an antiseptic, a sanitizer, an insect-repellent, an antiviral agent, and an organism-repellent.

20 Sub C4 9. The composition for treating the inside of a porous article as claimed in claim 8, wherein the chemical agent is a solution or powder of a metal salt, a metal compound, or a metal complex.

25 10. The composition for treating the inside of a porous article as claimed in claim 9, wherein the metal is at least

one metal selected from copper, arsenic, zinc, chromium, nickel, aluminum, molybdenum, magnesium, or silver.

11. The composition for treating the inside of a porous article as claimed in claim 8, wherein the chemical agent is
5 a solution or powder of a boron salt, a boron based compound, or a boron-containing complex.

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12. The composition for treating the inside of a porous article as claimed in claim 8, wherein the chemical agent is
10 an extract or extracted component from a plant, or a synthetic compound having a chemical agent structure equivalent to that of the extracted component from the plant.

13. The composition for treating the inside of a porous article as claimed in claim 12, wherein the extracted component from a plant or the synthetic compound having a chemical agent structure equivalent to that of the extracted component from the plant comprises tropolones, monoterpenes, sesquiterpenes, polyphenols, naphthalene derivatives, long
20 chain aliphatic alcohols, aldehydes, or allyl isothiocyanate.

14. The composition for treating the inside of a porous article as claimed in claim 8, wherein the chemical agent is
25 an aromatic compound or a cyclic compound, having one or more substituent(s) selected from a hydroxyl group, an amino group, a halogen atom, and a nitro group.

15. The composition for treating the inside of a porous article as claimed in claim 1, wherein the enzyme having a polyphenol oxidizing activity is a catechol oxidase, a laccase, a polyphenol oxidase, an ascorbic acid oxidase, or a bilirubin oxidase.

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16. The composition for treating the inside of a porous article as claimed in claim 1, wherein the enzyme having a polyphenol oxidizing activity is a mixture of an enzyme having a peroxidase activity and an oxidase capable of producing hydrogen peroxide.

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17. The composition for treating the inside of a porous article as claimed in claim 1, 15 or 16, wherein the enzyme having a polyphenol oxidizing activity is an enzyme obtainable by cultivating genus *Myrothecium*.

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20 > 18. The composition for treating the inside of a porous article as claimed in any of claims 1 and 15 to 17, wherein the enzyme having a polyphenol oxidizing activity is an enzyme which has an optimum reaction pH on an alkaline side not lower than pH 7.5 when measured of activity using syringaldazine.

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19. The composition for treating the inside of a porous article as claimed in any one of claims 1 to 18, wherein the composition is in the form of a high concentration solution

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to be diluted upon use, or powder or granulated powder to be dissolved upon use.

20. A method for treating a porous article, comprising the steps of impregnating a porous article with a composition for treating the inside of a porous article as claimed in any one of claims 1 to 7 and 15 to 19 as is, as diluted or as dissolved, and allowing macromolecularization reaction to occur in the porous article.

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21. The method for treating a porous article as claimed in claim 20, wherein the impregnation is performed under pressure and/or under reduced pressure.

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22. The method for treating a porous article as claimed in claim 21, wherein pressurization is performed at 1 to 20 atms.

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23. The method for treating a porous article as claimed in any one of claims 20 to 22, wherein at least one chemical agent selected from a fragrant, a deodorant, a rust preventive, a flame retardant, an antibacterial agent, an antiseptic, a sanitizer, an insect-repellent, an antiviral agent, or an organism-repellent is coated or impregnated to the porous article as a pretreatment or posttreatment.

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24. The method for treating a porous article as claimed in claim 23, wherein the chemical agent is a solution or fine powder of a metal salt, a metal compound, or a metal complex.
- 5 25. The method for treating a porous article as claimed in claim 24, wherein the metal is at least one metal selected from copper, arsenic, zinc, chromium, nickel, aluminum, molybdenum, magnesium, or silver.
- 10 26. The method for treating a porous article as claimed in claim 23, wherein the chemical agent is a solution or fine powder of a boron salt, a boron based compound, or a boron-containing complex.
- 15 27. The method for treating a porous article as claimed in claim 23, wherein the chemical agent is an extract or extracted component from a plant, or a synthetic compound having a chemical agent structure equivalent to that of the extracted component from the plant.
- 20 28. The method for treating a porous article as claimed in claim 27, wherein the extracted component from a plant or the synthetic compound having a chemical agent structure equivalent to that of the extracted component from the plant comprises tropolones, monoterpenes, sesquiterpenes, polyphenols, naphthalene derivatives, long chain aliphatic alcohols, aldehydes, or allyl isothiocyanate.

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29. The composition for treating a porous article as claimed in claim 23, wherein the chemical agent is an aromatic compound or a cyclic compound, having one or more substituent(s) selected from a hydroxyl group, an amino group, a halogen atom, and a nitro group.
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30. The method for treating a porous article as claimed in any one of claims 20 to 29, wherein the porous article is a sintered metal article, a cast article, an alloy, a die-cast article, a ceramic, a brick, concrete, wood, processed woody material, chaffs, rush, straw, bamboo, or foamed synthetic resin.
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31. The method for treating a porous article as claimed in any one of claims 20 to 30 above, wherein the phenolic compound and/or the aromatic amine compound in the liquid impregnated to the porous article is in a concentration of 0.1 to 30% by weight.
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32. The method for treating a porous article as claimed in any one of claims 20 to 31, wherein an enzyme having a polyphenol oxidizing activity in an alkaline pH region is used.
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33. The method for treating a porous article as claimed in any one of claims 20 to 32, wherein the porous article is washed before the macromolecularization reaction in the
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porous article proceeds sufficiently so that a controlled porosity is obtained.

34. The method for treating a porous article as claimed in
5 any one of claims 20 to 33, wherein the method has an effect
of imparting the porous article with strength, wear
resistance, weatherability, rust-preventing properties,
flame resistance, antibacterial properties, antiseptic
properties, sterilizing properties, insect-repellent
10 properties, insecticidal properties, antiviral properties,
organism-repellent properties, adhesiveness, chemical
agent-slow-releasing properties, coloring properties,
dimension stability, crack resistance, deodorizing
properties, deoxidizing properties, humidity controlling
15 properties, moisture conditioning properties, water
repellency, surface smoothness, bioaffinity, ion
exchangeability, formaldehyde absorbing properties,
chemical agent elution preventing properties, or properties
preventing the migration of inorganic compounds onto the
20 surface of the porous article.

35. A treated porous article obtainable by a method as claimed
in any one of claims 20 to 34.

25 36. The treated porous article as claimed in claim 35, wherein
the article retains porosity.